

Botany report for

Bullards Fire Restoration Invasive Species Treatments

(Short form Biological Evaluation/ Biological Assessment/ Noxious Weed Risk Assessment)

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My assessments, below, are based on FR GIS layers and other records for survey areas, TES occurrences (rare plants: USFWS T&E, FS Sensitive, and PNF Watch List), and NNIP infestations (non-native invasive plants).

PROJECT DETERMINATION SUMMARY

Survey summary: COMPLETE.

Rare plant (TES) summary:

- *No concerns*

Non-native invasive plants (NNIP) summary:

- *Concerns about NNIP in the project area are addressed with an integrated pest management program that meets the purpose and need for the project.*

PROJECT

- This project proposes to treat six species of non-native invasive plants (NNIP) within the western of the two quarry sites along Marysville Road in the vicinity of the New Bullards Bar Dam (Figure 1). These six species are: rush skeletonweed (*Chondrilla juncea*), yellow star-thistle (*Centaurea solstitialis*), Scotch broom (*Cytisus scoparius*), barbed goatgrass (*Aegilops triuncialis*), Italian thistle (*Carduus pycnocephalus*), and Medusa head (*Elymus caput-medusae*). This extensive infestation of NNIP occupies 24 acres within T18N, R7E, section 26, SE1/4. The following treatments would be used:
 - Chemical treatment (herbicides): Application methods would include select, directed spray, or wicking. No aerial application of herbicides is proposed in this project.
 - Manual treatment: Techniques include digging, hand pulling, or tarping.

SURVEYS

Surveys:

- Complete via a formal survey by Forest Service botanists in 2017 and later follow-up revisits in 2017:
 - Survey #051103_2017_005 (in 2017 for Bullards Fire restoration projects).
- Because the southern edge of the project area borders on non-Forest Service land, the CNDDDB GIS database (CNDDDB 2018) was checked for any reported occurrences of USFWS T&E and FS Sensitive species (PNF Watch List species are usually not recorded in this database).
 - California Natural Diversity Database (CNDDDB 2018).

Survey summary: COMPLETE.

RARE PLANTS (TES)

- None known from close enough to the project area to be of any concern.
 - The nearest rare plant locations are of Humboldt lily (*Lilium humboldtii* ssp. *humboldtii* – PNF Watch List) 0.7 miles to the northwest and Butte County fritillary (*Fritillaria eastwoodiae* – FS Sensitive) 1.1 miles to the southwest and 1.4 miles to the north.

Rare plant (TES) summary:

- No concerns

NON-NATIVE INVASIVE PLANTS (NNIP)

- Six species of NNIP are known from within this project area: rush skeletonweed (*Chondrilla juncea*), yellow star-thistle (*Centaurea solstitialis*), Scotch broom (*Cytisus scoparius*), barbed goatgrass (*Aegilops triuncialis*), Italian thistle (*Carduus pycnocephalus*), and Medusa head (*Elymus caput-medusae*) – see Table 1. These were first reported from this site as a result of the 2017 survey noted above for Bullards Fire Recovery restoration project planning.

Table 1. Acres of each of the six species of NNIP within the 24 acre project area.

Species	Acres ¹	CDFA category ²	Comments about distribution within project area
broadleaf herbs and shrubs			
skeletonweed (<i>Chondrilla juncea</i>)	16.5	A-List	sparsely scattered throughout
yellow star-thistle (<i>Centaurea solstitialis</i>)	16.8	C-List	scattered clusters of plants, especially along fill slopes
Italian thistle (<i>Carduus pycnocephalus</i>)	0.3	C-List	scattered small clusters of plants
Scotch broom (<i>Cytisus scoparius</i>)	1.9	C-List	mostly large plants, mostly scattered along north side
grasses			
barbed goatgrass (<i>Aegilops triuncialis</i>)	1.4	B-List	especially along Marysville Road
Medusahead grass (<i>Elymus caput-medusae</i>)	0.5	C-List	in a few scattered areas

¹These acres of different species mostly overlap, thus are only additive to a small extent.

²The California Department of Food and Agriculture's noxious weed list (CDFA 2018a) divides noxious weeds into categories A, B, and C (CDFA 2018b): A-listed weeds are those for which eradication or containment is required at the state or county level; B-listed weeds are those where eradication or containment is at the discretion of the County Agricultural Commissioner; and C-listed weeds require eradication or containment only when found in a nursery or at the discretion of the County Agricultural Commissioner.

- **Skeletonweed (*Chondrilla juncea*).** Skeletonweed, also called rush skeletonweed or hogbite, is a perennial or biennial forb in the sunflower family that, although found scattered throughout California, is considered an uncommon weed. It can grow in disturbed soils of roadsides,

croplands, irrigated grain fields, semi-arid pastures, rangelands, and residential properties. Plants are highly competitive for water and nutrients. Plants may reach reproductive maturity in 2 years or less, dense infestations can produce more than 1,000 viable seed per square meter, plants produce seeds every year, seed production may be sustained as long as 3 or more months annually, and plants can resprout readily when pulled, cut, grazed, or burned (Cal-IPC 2018). Some common herbicides, such as Glyphosate-based herbicides, are of limited use with skeletonweed, since plants re-sprout readily from their extensive root systems after treatment. Seeds appear to survive less than 3 years in the soil, so preventing existing plants from maturing seed, and pulling young seedlings, will exhaust the seed bank (DiTomaso et al. 2013). Rush skeletonweed is uncommon on the Feather River RD, although it appears to be slowly entering along roadsides from the southwest.

Skeletonweed, although sparsely scattered within the project area, is the most widespread NNIP at this site (Table 1). For this species in particular, being almost impossible to control through mechanical means, the use of herbicides is the only viable method to gain control of and ultimately eliminate it from the site. The ineffectiveness of popular Glyphosate-based herbicides on this species requires the use of stronger herbicides such as Triclopyr, Aminopyralid, Clopyralid, or Chlorsulfuron and Aminocyclopyrachlor.

- **Yellow star-thistle (*Centaurea solstitialis*).** Yellow star-thistle is an annual species in the sunflower family. Plants start out as rosettes of basal leaves in the winter, and in the late spring and through the summer they send up a many-branched stem 3 to 4 or more feet tall, with spiny flower heads at the tip of each branch. This species propagates rapidly by seed, and a large plant can produce nearly 75,000 seeds. Yellow star-thistle has invaded 12 million acres in California, where it inhabits open hills, grasslands, open woodlands, fields, roadsides, and rangelands, and it is considered one of the most serious rangeland weeds in the state. It is a serious nuisance on recreational lands, degrades the value of private property, range and timber lands, is toxic to horses, and poses a major threat to biodiversity in native ecosystems (CDFA 2018a). However, yellow star-thistle is not yet widespread in the Sierra Nevada, and an active multi-agency program is in place to locate and eliminate occurrences as they creep up into the mountains (e.g. the Yellow Starthistle Leading Edge Project). Although seeds can survive up to 10 years in the field, few seeds survive beyond three or four years; thus an infestation of yellow star-thistle can often be eliminated with three years of preventing seed set (DiTomaso et al. 2013). Pulling is usually effective in controlling this species except where growing in hard-compacted ground where plants may break off at the base and resprout. Yellow star-thistle is still uncommon on the Feather River RD, and its spread is actively discouraged by pulling plants whenever possible.

In the project area yellow star-thistle is known from clusters of plants at scattered sites, especially on less-compacted ground of the slopes around the edge of the quarry site (Table 1). While this species can usually be controlled using mechanical means, since it is often growing mixed with skeletonweed, which requires the use of herbicides, the use of herbicides on the star-thistle in this situation will be most effective. Once the population of skeletonweed is reduced and the use of herbicides for it is reduced, then pulling star-thistle plants is here recommended for final efforts at control and eradication.

- **Italian thistle (*Carduus pycnocephalus*).** Italian thistle is an annual forb in the sunflower family that is widely distributed in disturbed open sites, roadsides, pastures, annual grasslands, and

waste areas in much of California below about 3,000 ft elevation. Italian thistle reproduces only by seed, but a single large plant can produce 20,000 seeds in one season (Cal-IPC 2018). Seeds rarely persist in the soil seedbank for more than a few years. Italian thistle is still uncommon on the Feather River RD, and its spread is actively discouraged by pulling plants whenever possible.

In the project area Italian thistle is known from scattered small clusters of plants (Table 1). As with yellow star-thistle, although this species can be controlled by repeated pulling, the use of herbicides while targeting the skeleton weed at the site will be most efficient, and it will be safer to not also have separate crews on site pulling plants in areas of herbicide application.

- **Scotch broom (*Cytisus scoparius*)**. Scotch broom is a perennial shrub in the pea family. It generally grows in sunny sites with dry sandy soil, and can spread rapidly through pastures, borders of forests, and roadsides. Scotch broom can be found from the coast to the foothills of the Sierra Nevada and the Cascade Range. These weeds crowd out native species, have a seed-bank that can remain dormant for up to 80 years, diminish habitat for grazing animals, and increase risk for wildland fires (Cal-IPC 2018). Scotch broom is a troublesome weed that is widely distributed in the lower elevations on the western side of the Plumas NF, such as the project area and on surrounding FS and private lands.

In the project area the infestation of Scotch broom is of mostly large plants, mostly scattered along north side of the project area (Table 1). Large plants are few enough here that pulling them is the most straight-forward option. However, for those plants that are too large to pull, the most efficient option is to cut them at the base and immediately paint or spray the stumps with an herbicide such as Triclopyr. The masses of seedlings that will likely grow after the large plants are removed may be removed via mechanical means (pulling, flaming) or more efficiently by using an herbicide such as Glyphosate or Triclopyr. Glyphosate is preferable in this situation because broom seedlings are easily controlled by it and the Glyphosate has shorter-term effects on the environment than Triclopyr. After the first year or two of treatments, new sprouts should be sparse enough that hand-pulling only will be sufficient.

- **Barbed goatgrass (*Aegilops triuncialis*)**. Barbed goatgrass is a late-season annual grass with spikes that resemble those of winter wheat. In North America it is only found in California and Oregon, primarily in northern California, and especially in the Central Valley foothills northward to southern Oregon; it is still expanding its distribution. It grows in rangelands, grasslands, and oak woodlands and is becoming a dominant grass in the foot-hill grasslands of central California. Seeds of barbed goatgrass can remain viable for two years or more in the soil. Hand-pulling or hoeing small infestations is effective (DiTomaso et al. 2013, Cal-IPC 2018). Barbed goatgrass is still uncommon on the Feather River RD, and its spread is actively discouraged by pulling plants whenever possible.

In the project area barbed goatgrass is found mostly along the sides of Marysville Road as it passes through the project area (Table 1). Where this species occurs it is far too dense to control by any means other than the use of herbicides. Being a grass, rather than a forb such as the other species discussed above, it requires the use of different herbicides than those broad-leaved species. Thus the application of herbicides to this species will need to be done somewhat separately from the treatment of those species. Control of this species, and Medusahead, may also be necessary so that it does not colonize areas where the broad-leaved invasive plants are treated.

- **Medusahead (*Elymus caput-medusae*).** Medusahead is an annual grass that commonly invades disturbed sites, grasslands, openings in chaparral and oak woodlands. It is found throughout northwestern California, where it can out-compete native grasses and forbs. After they set seed, Medusahead plants can persist as a dense litter layer that prevents germination and survival of native species and contributes to fire danger in the summer (Cal-IPC 2018). Most seed appears to germinate or lose viability within two years in the soil (Di-Tomaso et al. 2013). Small infestations may be controlled by repeated pulling or hoeing of plants before they set seed, but large infestations can be difficult to control. Medusahead is still uncommon on the Feather River RD, although several low-elevation meadows have infestations that are large enough to be problematical.

In the project area Medusahead is known from a few scattered areas (Table 1). There is too much of this in the project area to efficiently manage using mechanical means, thus the use of herbicides, as noted above for barbed goatgrass, is recommended. Control of this species, and barbed goatgrass, may be necessary so that it does not colonize areas where the broad-leaved invasive plants are treated.

- Based on information presented above about the efficacy of various treatment options for each of the six species of NNIP, this project proposes a program of integrated pest management to eradicate or control these six species (Table 2). Some species, such as skeletonweed, yellow star-thistle, and Italian thistle, have potential to be eradicated from the site within 3-4 years if seed production is completely prevented, but others, such as Scotch broom, have seeds that can persist in the soil, sprouting from time to time, for 30 years or more.

Table 2. Bullards Fire Restoration Invasive Species Treatments.

Species name	Management Goal	Proposed Initial Treatment Options ¹	Follow-up Treatment Options ¹
broadleaf herbs and shrubs			
skeletonweed	Eradicate (first priority)	Aminopyralid, Triclopyr, or Clopyralid, select or directed spray; Chlorsulfuron and Aminocyclopyrachlor directed spray	Aminopyralid, Triclopyr, or Clopyralid, select or directed spray; dig out widely scattered plants after the infestation is greatly reduced
yellow star-thistle	Eradicate	Aminopyralid, Triclopyr, or Clopyralid, select or directed spray	Pulling plants prior to flowering, for widely scattered plants after the infestation is reduced
Italian thistle	Eradicate	Aminopyralid, Triclopyr, or Clopyralid, select or directed spray	Pulling plants prior to flowering, for widely scattered plants after the infestation is reduced
Scotch broom	Eradicate	Pull shrubs that are small enough; cut larger plants, treat their stumps, fresh or re-sprouting, with Triclopyr	Treat masses of seedlings with Triclopyr or Glyphosate; otherwise continue pulling plants

grasses			
barbed goatgrass	Control	Fluazifop-P-butyl or Imazapyr, select or directed spray	Fluazifop-P-butyl or Imazapyr, select or directed spray
Medusahead grass	Control	Fluazifop-P-butyl or Imazapyr, select or directed spray	Fluazifop-P-butyl or Imazapyr, select or directed spray

¹In most cases only one or two herbicides would be used at a time, and only one or two applications per year is anticipated. Treatments will decrease in intensity as control and eradication is accomplished.

- **Aminocyclopyrachlor + Chlorsulfuron** (Perspective®): Perspective provides pre-emergence and/or post-emergence control of broadleaf weed species. A post-emergence application must be used for perennial weed species such as skeletonweed.
- **Aminopyralid** (trade names include Capstone, Milestone®). This herbicide provides mainly post-emergence control of many annual, biennial, and perennial invasive plant species, including brooms and yellow star-thistle. It is selective and it does not injure grasses and many broadleaf species, although it can injure legumes (Fabaceae) and members of the sunflower family (Asteraceae). For some species, aminopyralid can provide residual (pre-emergence) control, thereby reducing the need for re-treatment. Within the soil, aminopyralid does not persist for long (less than 2 weeks) and is relatively immobile.
- **Chlorsulfuron** (trade names include Telar®). This herbicide provides pre- and post-emergence control of many broadleaf invasive plants and some annual grasses. It is selective and does not injure most perennial grasses. It is absorbed by the leaves and roots. It is generally active in the soil and tends to leach in permeable soils. It can remain in soil for 1 to 3 months.
- **Fluazifop-P-butyl** (trade names include Fusilade® 30 Ornamec® 170 Grass Herbicide). This herbicide is a post-emergent herbicide. It is used for both annual and perennial grasses. It is much less toxic to broad leaf plants and non-grass narrow leaved plants. It can remain in soil for 1 to 2 months.
- **Glyphosate** (trade names include Accord®, Aquamaster®). This is one of the most widely used herbicides available. It is non-selective (broad spectrum), so it may injure non-target plants. It provides only post-emergent control and is not absorbed through roots. It is non-persistent and relatively immobile in soil, although it can remain in soil for 4 to 8 months. This non-persistence and relative immobility in the soil means that glyphosate is often the most environmentally benign of the commonly used herbicides. Plants treated with glyphosate can take several weeks to die; repeat application is often necessary to remove plants that were missed during the first application.
 - There has been some controversy and public alarm recently concerning safety issues in the use of glyphosate. Disparate reporting by various public agencies and NGOs regarding potential risks to applicators and to the public has led to much confusion around this issue. The California Invasive Plant Council (Cal-IPC), a non-profit organization, has prepared a “fact sheet and position statement” summarizing all best-available science and policy on this issue (Cal-IPC 2017). Cal-IPC summarizes its policy on the use of glyphosate thus: “Cal-IPC supports the use of glyphosate in invasive plant management as part of an Integrated Pest Management (IPM) approach. When using glyphosate according to the label, with appropriate personal protective equipment and best practices, glyphosate is low-risk for wildlife, applicators and the public.” Cal-IPC’s fact sheet and position statement is presented, in its entirety, in Appendix B.
- **Imazapyr** (trade names include Habitat®). This herbicide provides mainly post-emergence control of annual and perennial grasses, some broadleaf species, and woody species. It is

nonselective (broad spectrum), so it may injure non-target plants. For some species, imazapyr can provide residual (pre-emergence) control, thereby reducing the need for re-treatment. It can remain in soil for 4 months to over 1 year.

- **Triclopyr** (trade names include Garlon™ 3A, Milestone VM Plus). This herbicide provides pre- and post-emergence control of woody and broadleaf plants and re-sprout control as stump treatment on woody plants. It is selective and has little impact on grasses. It can reside in soils for up to 6 months. Triclopyr can be used in combination with aminopyralid in a pre-mixed formulation (e.g. Milestone VM Plus).
- Design criteria to protect human health, water quality, and natural resources will be incorporated into the proposed action. Herbicides would be applied in accordance with: 1) product label directions; 2) California Department of Pesticide Regulation requirements; 3) Forest Service best management practices for water quality (USDA Forest Service 2011); and 4) Forest Service direction (FSM 2900, 2150 and 2200) and Handbook (FSH 2109.14). This project will include a Pesticide Use Spill Plan. Prior to any herbicide use, a Pesticide Use Proposal (PUP) (FS-2100-2) and safety plan (FS-6700-7) will be completed by the project leader and approved by the Responsible Official. These documents will be included in the project record.
 - Specific design features, best management practices, and mitigation measures are summarized in Appendix A (Table 3).
 - A June 20, 2014, Presidential Memorandum recommends additional best management practices to promote the health of honey bees and other pollinators. To address this recommendation, the U.S. Department of Agriculture and U.S. Department of the Interior have developed best management practices to protect pollinators when implementing management activities, including pesticide treatments (USDA and USDI 2015). Although not yet required, these best management practices would be followed and are consistent with the project design features for this project.

Non-native invasive plants (NNIP) summary:

- *Concerns about NNIP in the project area are addressed with an integrated pest management program that meets the purpose and need for the project.*

REFERENCES

Cal-IPC. 2017. California Invasive Plant Council Cal-IPC. Cal-IPC Fact Sheet and Position Statement – The Use of Glyphosate for Invasive Plant Management.

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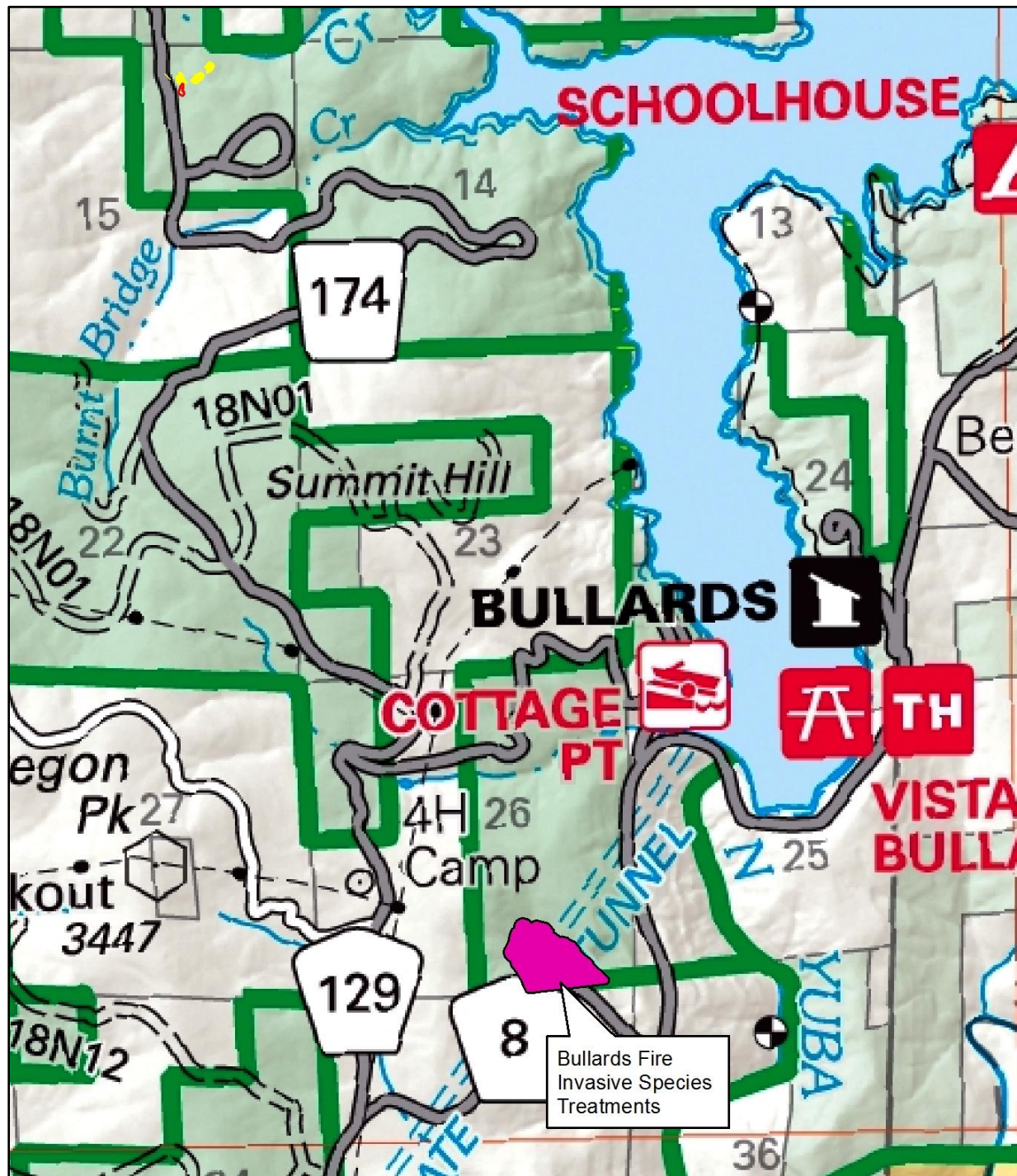
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Figure 1. Bullards Fire Restoration Invasive Species Treatments project area. Map showing location of the project in bright pink. Yuba County, Challenge 7½' quad, T18N, R7E, Section 26. Scale approx. 1" = ½ mile.



Appendix A

Design Features, Best Management Practices, and Mitigation Measures

Design Features. In response to internal and external scoping on the proposal, we developed project design features to moderate some of the potential impacts the proposed action may cause. Project design features are described below in Table 3, and include those required for protection of soil and water, and wildlife. These project design features are important for reducing the effects of the proposed action. Therefore each year, as an implementation plan is prepared, we would review and apply them, as appropriate.

Table 3. Project design features.

ID	Project design feature	Purpose
General Herbicide Use Design Features		
1	Herbicide application will comply with product label directions and applicable legal requirements.	To avoid or minimize the risk of soil, surface water, or groundwater contamination. To minimize risk to special status plants and wildlife as well as other biological resources. To ensure compliance with legal requirements. Compliance with BMP 5.8 (USDA Forest Service 2011)
2	Herbicide formulations would be limited to those containing one or more of the following seven active ingredients: aminocyclopyrachlor, aminopyralid, chlorsulfuron, fluazifop-P-butyl, glyphosate, imazapyr, and triclopyr.	To minimize potential adverse effects on workers, forest users, and resources.
3	Herbicide applications would only treat the minimum area necessary to meet site objectives.	To minimize potential adverse effects on workers, forest users, and resources.
4	Herbicide application methods are limited to select (e.g. low pressure hand sprayer, wicking, wiping, stem injection) and directed spray (use of backpack sprayer or hand held nozzle to aim application at specific target species), as permitted by the product label and project design features. No aerial herbicide applications will occur (USDA and USDI 2015).	To minimize potential adverse effects on workers, forest users, and resources.
5	Spray application drift control measures: 1) Only ground based equipment will be used 2) All applications will cease when weather conditions exceed those on the label 3) Applications will not be performed when the National Weather Service forecasts a greater than 70 percent probability of measurable precipitation (greater than 0.1 inches) within the next 24 hour period 4) Applications will cease when wind speed exceeds 10 mph 5) Spray nozzles will produce a relatively large droplet size (500-800 microns) 6) Low nozzle pressures will be used (15 psi) 7) Spray nozzles will be kept within 24 inches of target vegetation during spraying 8) A pressure gauge or pressure regulator will be required on each backpack sprayer	To minimize the risk of pesticide drift onto water or non-target areas, in order to minimize impacts to water quality, special status plants and wildlife, non-target vegetation, and other biological resources (e.g. pollinators, aquatic organisms). Compliance with BMP 5.13 (USDA Forest Service 2011) and BMPs regarding pollinators (USDA and USDI 2015)

6	Herbicides will be applied by trained and/or certified applicators in accordance with label instructions and applicable federal and state pesticide laws. Mixing of herbicides will be supervised onsite by, at a minimum, a Qualified Applicator certified by the State of California.	To establish the level of trained / certified personnel for herbicide applications.
7	Personal Protective Equipment (PPE) will be used in accordance with the product label and California Department of Pesticide Regulation requirements.	To minimize potential adverse effects to workers.
8	Chemicals will be stored in designated storage facilities consistent with FSM 2109.14, Chapter 40. Unused herbicides will be disposed of in accordance with the product label and FSM 2109.14, Chapter 40. If the product label and FSM differ, the more restrictive storage and disposal guidelines will be followed.	To minimize potential adverse effects on workers, forest users, and resources. Compliance with BMP 5.11 (USDA Forest Service 2011).
9	No directed spray or broadcast herbicide application will occur on weekend days between Memorial Day and Labor Day in recreation sites (campgrounds, trailheads, and dispersed camping areas).	To minimize potential adverse effects on forest users.
10	For herbicide treatment within 100 feet of recreation sites (campgrounds, trails, and trailheads), cautionary notice signs will be posted at the recreation site prior to herbicide treatments.	To inform and to minimize potential adverse effects on forest users.
Soil and Water Design Features		
11	Areas with bare soil created by the treatment of noxious weeds would be evaluated for rehabilitation (i.e. reseeded, mulching, etc.)	To ensure that the treatment of noxious weeds is not creating open areas or bare areas for spread of noxious weeds and to protect water quality and riparian habitat.
12	Areas outside of ephemeral stream: If treatment reduces soil cover to less than 50% for a contiguous area of >0.25 acres, then mulching and/or revegetation may be required to minimize erosion and reestablish native vegetation. Only native plant species will be used in revegetation. All mulch and seed material will be certified weed-free. Areas within 50 feet of ephemeral stream: If treatment reduces soil cover to less than 70% for a contiguous area of >0.1 acres, then mulching and/or revegetation may be required to minimize erosion and reestablish native vegetation. Only native plant species will be used in revegetation. All mulch and seed material will be certified weed-free.	To ensure that the treatment of noxious weeds is not creating open areas or bare areas for spread of noxious weeds and to protect water quality and riparian habitat.
13	Herbicide mixing will not occur within 150 feet of the ephemeral stream and inside ditch. The cleaning and disposal of herbicide containers will be done in accordance with Federal, State, and local laws, regulations, and directives.	To reduce risk of contamination of water by accidental spill.
14	When applying herbicides with a backpack sprayer all directed spray will be done in a downward direction in accordance to the herbicide's label. This will minimize herbicide drift and confine the herbicide to the drop zone of the individual weed plant being treated.	To control drift within the entire project area especially within sensitive areas and near water.
15	All herbicide application will follow EPA approved label directions in regards to control of drift of herbicides during spraying. These directions have specific wind speeds and air temperatures for application of each herbicide. Applicators will utilize droplet size and spray pressure to insure droplets do not travel outside of the drip line target plant. A colorant would be added to the herbicide mixture prior to spraying. Spray cards may be used to aid in detecting herbicide drift.	To control drift of herbicides onto unintended targets and to minimize risk of surface water contamination.

16	POEA surfactants will not be used within 150 feet of live waters.	To protect aquatic organisms.
17	Roadside ditches will be treated the same as the water body type they resemble.	To project water quality and meet SNFPA Riparian Management Objectives. Also to ensure that TECS and Special Interest plants are protected.
18	Application of Aminocyclopyrachlor, and Imazapyr will be limited to late spring and early summer. No application of these chemicals after that timeframe.	To project water quality.
19	Application Chlorsulfuron and Clopyralid will not be allowed in the fall.	To protect water quality.
Wildlife Design Features		
20	The spraying of herbicide will take place when soils are dry or a dry period when there is no chance of rain. This is the same as per the limiting operating period (LOP) for amphibians October 15 through March 1st, if a rain event should occur and last greater than 72 hours prior to October 15th activities then there should be no spraying of herbicide until a drying event.	To protect amphibians.
21	If threatened, endangered, or proposed species are listed or discovered within an area in which they may be adversely affected by activities, protection measures should be followed as recommended by a biologist, as appropriate for the species.	To protect T&E wildlife species, if found on-site.
22	The non-native invasive plants would be treated prior to flowering to ensure that Western bumblebees are not present on plants during herbicide application.	To protect Western bumblebees.

Appendix B
Cal-IPC fact sheet and position statement
on the use of glyphosate for invasive plant management

The California Invasive Plant Council (Cal-IPC - www.cal-ipc.org/) is a non-profit organization. Their mission, as presented on their web site: “Cal-IPC’s mission is to protect California’s lands and waters from ecologically-damaging invasive plants through science, education and policy. Cal-IPC formed in 1992 to address one of California’s top environmental threats. We work closely with agencies, industry and other nonprofit organizations. Our active membership includes public and private land managers, ecological consultants and researchers, planners, volunteer stewards, and concerned citizens. Allied invasive plant councils exist in many other states, though Cal-IPC has the largest membership.”

To date, only two issues have been so critical to the mission of Cal-IPC that they have prepared formal policy statements. The first, dated April 5, 2008, is “Cal-IPC Policy on Integrated Weed Management (IWM),” which is a cornerstone of weed management nationally and locally. The second, dated October 10, 2017, is “The Use of Glyphosate for Invasive Plant Management.” This second policy statement, regarding the use of glyphosate, was prepared in response to the public concerns resulting from disparate reports on the carcinogenicity of glyphosate from various governmental and non-governmental sources. This Cal-IPC fact sheet and position statement on the use of glyphosate for invasive plant management is available on their web site (www.cal-ipc.org/wp-content/uploads/2017/11/Cal-IPC-glyphosate-policy.pdf) and is copied verbatim below.

Cal-IPC summarizes their policy on the use of glyphosate thus: “Cal-IPC supports the use of glyphosate in invasive plant management as part of an Integrated Pest Management (IPM) approach. When using glyphosate according to the label, with appropriate personal protective equipment and best practices, glyphosate is low-risk for wildlife, applicators and the public.”

Cal-IPC FACT SHEET and POSITION STATEMENT

2017.10.20

The Use of Glyphosate for Invasive Plant Management

Background on Issue

In 2015, the World Health Organization’s International Agency for Research on Cancer (IARC) classified glyphosate, the active ingredient in RoundUp herbicide, as “probably carcinogenic to humans.” IARC classifies many substances, including naturally-occurring substances, as probable carcinogens.

Other agencies have recently reached different conclusions from IARC. For example, the US Environmental Protection Agency (EPA) and the European Food Safety Authority re-examined all pertinent scientific studies and disagreed with the IARC conclusion. In its 2016 Issue Paper on glyphosate, the US EPA concluded that the best descriptor based on the science is that glyphosate is “not likely to be carcinogenic to humans” at doses relevant to human health risk. And the September 2016 issue of the journal *Critical Reviews in Toxicology* published comprehensive reviews by expert panels, concluding that glyphosate is “unlikely to pose a carcinogenic risk to humans.”

Further, if one accepts the IARC classification of glyphosate as “probably carcinogenic to humans,” this does not mean that glyphosate has been shown to cause cancer in people. The IARC classification designates a substance’s carcinogenic potential, but does not consider actual exposures in real-world situations. When they did consider exposure, the World Health Organization itself (through its Panel of

Experts on Pesticide Residues in Food and the Environment) and the United Nation's Food and Agriculture Organization, in a joint meeting in 2016, concluded that "glyphosate is unlikely to pose a carcinogenic risk to humans from exposure through the diet."

In December 2016, experts convened by the US EPA as a Scientific Advisory Panel to review EPA's earlier Issue Paper were split in their expert opinion. Some agreed with the Issue Paper's conclusion that glyphosate is not likely to be carcinogenic to humans, especially at reasonably foreseeable dose-rates, while other panel members thought it would be more accurate to say that there is "suggestive evidence of carcinogenic potential." Panelists noted that crucial data were equivocal, and that additional data on cancer morbidity and/or mortality from studies of glyphosate-exposed workers would be desirable.

In California, the IARC classification triggered the California Office of Environmental Health & Hazard Assessment (OEHHA) to mandate that products containing glyphosate receive a Prop. 65 warning label as a "known carcinogen." This went into effect on 7/7/2017. OEHHA has proposed the establishment of a "no significant risk level" (NSRL) for glyphosate. The initial proposed level is 1.1 mg/day. This value is based on lifetime (1-2 years) dietary exposure tests with rodents, with the results scaled for humans. OEHHA has solicited peer review and public comment, and has not specified when a final rule will be available. More information is needed on the relationship between this level and the frequency of exposure, since assessments of carcinogenicity are based on long-term, chronic exposure estimates.

No guidance has been published on how this NSRL relates to the typical exposure scenario for a land manager applying glyphosate. The EPA Science Advisory Panel Report estimates exposures as high as 0.03-7 mg/kg/day for mixer-loaders and 0.02-0.03 mg/kg/day for applicators, but these estimates include applications that are made in agricultural settings using the maximum rate per acre allowed by product labeling. Further, these estimates do not factor in the use of personal protective equipment (PPE) such as coveralls, eye protection and chemical-resistant gloves. The US Forest Service (USFS) estimates that a glyphosate application rate of 1.2 lbs a.e./acre via backpack sprayer would result in an applicator exposure of 1.1 mg/day. This application rate and its corresponding applicator exposure estimate are likely overestimations in the majority of glyphosate applications for wildland weed control. This is primarily due to the fact that wildland weed control projects generally use spot spraying and not broadcast applications. Further, as with the US EPA estimates, the USFS exposure value does not factor in the use of PPE.

Cal-IPC Position on Issue

Cal-IPC supports the use of glyphosate in invasive plant management as part of an Integrated Pest Management (IPM) approach. When using glyphosate according to the label, with appropriate personal protective equipment and best practices, glyphosate is low-risk for wildlife, applicators and the public.

Cal-IPC Background

Cal-IPC has a formal policy on Integrated Weed Management which supports the use of herbicides as part of an Integrated Pest Management (IPM) approach. Decisions should be based on the best-available scientific information. As new information becomes available, it should be incorporated, and positions and practices should be adjusted accordingly.

Cal-IPC is dedicated to environmental protection and science-based public policy. We support the work of environmental colleagues to reduce risks from toxics in the environment as well as work of scientists at EPA and OEHHA to objectively assess the level of risk from herbicides such as glyphosate.

References

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Cal-IPC Policy on Integrated Weed Management: <http://www.cal-ipc.org/wp-content/uploads/2017/10/Cal-IPC-Policy-on-IWM.pdf>

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